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09/975,049	10/10/2001	Ishai Nachumovsky	TSL-105	1005

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EXAMINER

WEISS, HOWARD

ART UNIT PAPER NUMBER

2814

DATE MAILED: 06/10/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/975,049

Applicant(s)

NACHUMOVSKY, ISHAI

Examiner

Howard Weiss

Art Unit

2814

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 01 April 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-6, 9, 10 and 18-28 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-6, 9, 10 and 18-28 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

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Attorney's Docket Number: TSL-105

Filing Date: 10/10/02

Continuing Data: none

Claimed Foreign Priority Date: none

Applicant(s): Nachumovsky

Examiner: Howard Weiss

***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in–

- (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effect under this subsection of a national application published under section 122(b) only if the international application designating the United States was published under Article 21(2)(a) of such treaty in the English language; or
- (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that a patent shall not be deemed filed in the United States for the purposes of this subsection based on the filing of an international application filed under the treaty defined in section 351(a).

2. Claims 1 to 3 and 10 are rejected under 35 U.S.C. 102(e) as being anticipated by Sung et al. (U.S. Patent No. 6,504,206).

Sung et al. show all aspects of the instant invention (e.g. Figures 2) including:

- a semiconductor region **10** of a first conductivity
- first and second source/drain regions **33,34** of a second conductivity opposite the first conductivity and a channel region located between said first and second source/drain regions said source/drain regions continuous with diffusion bit lines **BL-1, BL-2**
- a silicon dioxide gate dielectric layer **11** (Figures 1)
- first and second polysilicon floating gate electrodes **1,2** with a gap **17** between respective first and second vertical edges with respect to an upper surface of the semiconductor region

- an ONO dielectric layer **18**
- a polysilicon control gate **32** with a first portion extending into said gap and separated from the channel region by the dielectric layer and the gate dielectric layer

***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sung et al. and Yang et al. (U.S. Patent No. 5,973,353).

Yang shows most aspects of the instant invention (Paragraph 2) except for the control gate having a metal silicide. Yang et al. teach (e.g. Figure 3) to put metal silicide **28** in a control gate to increase the conductivity of the control gate (Column 4 Lines 36 and 37). It would have been obvious to a person of ordinary skill in the art at the time of invention to put metal silicide as taught by Yang et al. in the control gate of Yang to increase the conductivity of the control gate.

5. Claims 4 to 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sung et al. and Pham et al. (U.S. Patent No. 6,242,306).

Yang shows most aspects of the instant invention (Paragraph 2) except for first and second oxide regions/layers located over said bit lines. Pham et al. teach (e.g. Figures 1 and 2) to put first and second oxide regions/layers **19** located over bit lines **21-23** to make an improved EEPROM (Column 2 Lines 41 to 65). It would have been obvious to a person of ordinary skill in the art at the time of invention to put first

and second oxide regions/layers located over bit lines by Pham et al. in the device of Sung et al. to make an improved EEPROM.

6. Claims 18 to 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Liang et al. (U.S. Patent No. 6,281,545) and Pham et al..

Liang et al. show most aspects of the instant invention (e.g. Figure 8) including:

- a semiconductor region **12**
- first and second source/drain regions **14',30',14'',30''** and a channel region located between said first and second source/drain regions
- a silicon dioxide gate dielectric layer **16** located over the channel region and portion of said first and second source/drain regions
- first **18'** and second **18''** polysilicon floating gate electrodes **14** with a gap therebetween
- an ONO dielectric layer **19** located over first sidewalls and upper surfaces of said first and second floating gates said first sidewalls defining said gap
- first and second sidewall oxide regions **28** located on second sidewalls of said floating gates
- a polysilicon control gate located over said dielectric layer comprising a first polysilicon portion **20** extending into said gap and metal silicide **22**

Liang et al. do not show the control gate over the first and second sidewall oxide regions, the first and second source/drain regions continuous with first and second bit lines and first and second oxide regions/layers located over said bit lines. Pham et al. teach (e.g. Figures 1 and 2) to make continuous first and second source/drain regions **14** continuous with first and second bit lines **36,38**, first and second oxide regions/layers **19** located over said bit lines and a control electrode formed over the sidewalls of the floating gates **24** for making an improved EEPROM (Column 2 Lines 41 to 65). It would have been obvious to a person of ordinary skill in the art at the time of invention to make continuous first and second source/drain regions

continuous with first and second bit lines, first and second oxide regions/layers located over said bit lines and a control electrode formed over the sidewalls of the floating gates as taught by Pham et al. in the device of Liang et al. for making an improved EEPROM.

### ***Response to Arguments***

7. Applicant's arguments with respect to claims 1 to 6, 9 and 10 have been considered but are moot in view of the new ground(s) of rejection.
8. Applicant's arguments filed 4/1/03 have been fully considered but they are not persuasive. The Applicant states that the features of Pham et al. can not be combined with that of the device of Liang et al. since the methods of Liang et al. and Pham et al. are inconsistent with each other. While the Examiner agrees that some of the processes of each of these prior art maybe inconsistent it does not necessarily mean that the features of these device could be combine in another way which is consistent with the inventive features expressed by both. When considering claims directed toward a device, processes revealed in the prior art do not necessarily preclude the combination of the pertinent features by another method. In this case, the sidewalls of Liang et al. are not an essential feature of the invention (See Column 1 Lines 30 to 42 for the inventive structure). These sidewalls could be incorporated at the step shown in Figure 8 of Pham et al. In view of these reasons and those set forth in the present office action, the rejections of the stated claims stand.

### ***Conclusion***

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

10. Papers related to this application may be submitted directly to Art Unit 2814 by facsimile transmission. Papers should be faxed to Art Unit 2814 via the Art Unit 2814 Fax Center located in Crystal Plaza 4, room 3C23. The faxing of such papers must conform with the notice published in the Official Gazette, 1096 OG 30 (15 November 1989). The Art Unit 2814 Fax Center number is **(703) 308-7722** or **-7724**. The Art Unit 2814 Fax Center is to be used only for papers related to Art Unit 2814 applications. The official TC2800 Before-Final, **(703) 872-9318**, and After-Final, **(703) 872-9319**, Fax numbers will provide the fax sender with an auto-reply fax verifying receipt of their fax by the USPTO.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Howard Weiss at **(703) 308-4840** and between the hours of 8:00 AM to 4:00 PM (Eastern Standard Time) Monday through Friday or by e-mail via **Howard.Weiss@uspto.gov**.

Any inquiry of a general nature or relating to the status of this application should be directed to the Group 2800 Receptionist at **(703) 308-0956**.

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12. The following list is the Examiner's field of search for the present Office Action:

Field of Search	Date
U.S. Class / Subclass(es): 257/ 316, 326	thru 6/3/03
Other Documentation: none	
Electronic Database(s): EAST	thru 6/3/03

HW/hw  
3 June 2003

Howard Weiss  
Examiner  
Art Unit 2814



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